

REMARKS

Claims 1 – 26 were pending in the present application. Claims 1 – 26 remain pending in the present application.

Claims 1 – 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frey et al. (U.S. Patent Number 6,029,168, hereinafter 'Frey') in view of Mukherjee (U.S. Patent Number 6,466,978, hereinafter 'Mukherjee'). Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Frey in view of Mukherjee, further in view of Banerjee et al., (U.S. Patent No. 6, 795, 830, hereinafter, 'Banerjee'). Applicant respectfully traverses these rejections and requests reconsideration in view of the following remarks.

Rejections Of Independent Claims

Claim 1 recites a method comprising, in pertinent part, associating **a signature** with the data object, **indicative of a state of the data object**; querying the second storage environment **for a change to the signature** in preparation for a data access operation on the data object, and **updating** the first data structure **if the signature has changed**.

In rejecting claim 1, the Examiner asserts that Frey discloses “associating a signature with the data object”, and recites col. 2, lines 55 – 61 of Frey in support. The Examiner does not appear to address the limitation “indicative of the state of the data object” recited in claim 1. Column 2, lines 55 – 61 of Frey teach:

It is another object of this invention to provide system-wide unique pointers for consistent, reliable access to distributed file data blocks. The present invention utilizes a specialized data element which enables indication of the location of another data element in a very diverse and distributed file data environment residing across several computing systems and storage devices.

The cited lines of Frey do not disclose a signature indicative of a state of a data object, as recited in Claim 1. Applicants can find no teaching or suggestion anywhere in either Frey, Mukherjee or Banerjee, taken singly or in combination, of such a signature.

Further with respect to claim 1, the Examiner asserts that Frey discloses “querying the second storage environment for a change to the signature”, and cites column 2, lines 33 – 40 in support of this assertion. Applicants respectfully disagree with this assertion. Since Frey does not disclose a signature indicative of a state change, Frey cannot disclose querying a second storage environment for a change to such a signature. Column 2, lines 33 – 40 of Frey teach:

In such a system, the difficulties in maintaining consistency across these map copies is monumental. Any changes in the file resource information must be incorporated into each map at each location in a manner that makes all the changes appear to be simultaneous, in order to maintain file system consistency. Writing and updating file resource information for each map at each location any time a change is made requires and incurs substantial file system overhead.

Applicants can find no teaching or suggestion in the cited lines, or anywhere else in either Frey, Mukherjee or Banerjee, taken singly or in combination, of “**querying the second storage environment for a change to the signature**”, as recited in claim 1.

Still further with respect to claim 1, the Examiner asserts that Mukherjee discloses “updating the first data structure”, and cites Column 10, lines 31 – 38 and lines 57 – 59, and Column 5, lines 35 – 41 of Mukherjee in support. Once again, the Examiner does not appear to address the limitation of “**updating the first data structure if the signature has changed**”, as recited in claim 1. The lines of Mukherjee cited by the Examiner are:

(Col. 10, lines 31 – 38): Referring to FIG. 6C, a client 131 initiates a file operation by locating the file and then sending a request to the associated disk manager 134. At step 156 the client 131 queries the file locator table 144 to determine upon which disk 132 the desired file is located. The client 131 then queries the disk locator table 142 at step 158 to find the

disk manager 134 that is associated with the disk 132, step 158, sends a file request to that disk manager 134, step 160.

(Col: 10, lines 57 – 59): The control information in the network manager mirror 140 and disk manager mirror 138 is then updated, step 174.

(Col. 5, lines 35 – 41): Metadata management is a medium load server task that is required in a serverless file system approach if the clients cache metadata information. When write operations by other clients cause the metadata to be modified, the client that is acting as server either logically remaps the cached metadata or informs the other clients to reload the new metadata.

As noted above, neither Frey, Mukherjee nor Banerjee teach or suggest associating a signature with a data object, where the signature is indicative of a state of the data object. Applicants can find no teaching or suggestion in the cited lines, or anywhere else in either Frey, Mukherjee or Banerjee, taken singly or in combination, of updating a data structure **if the signature has changed**, as recited in claim 1.

The Examiner is no doubt aware that to establish a *prima facie* obviousness of a claimed invention, **all claim limitations must be taught or suggested by the prior art.** *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974), MPEP 2143.03. Applicants respectfully submit that the cited art does not teach or suggest all the limitations of the currently pending claim 1, and that the rejection of claim 1 is therefore improper. Applicants therefore respectfully request the Examiner to either point out exactly where in Frey, Mukherjee or Banerjee the limitations discussed above are taught or suggested, or withdraw the rejection of claim 1.

As noted in a response to a previous Office Action, Applicants furthermore respectfully disagree with the Examiner's assertion that it would have been obvious to modify the teachings of Frey with the teachings of Mukherjee "in order to maintain system consistency and accuracy especially when subsequent requests are received." Frey specifically teaches that "the present invention provides a distribution of entries, such as fields and indexes or any commands that are used to describe and work with data, **without replication of the entries.**" (Col. 2, lines 47 – 50) Accordingly, Frey would

appear to teach away from a system that employs disk manager mirrors as disclosed by Mukherjee.

Independent claim 9 recites limitations similar to those of claim 1, and is therefore believed to patentably distinguish over the art cited by the Examiner for at least the reasons cited above.

Independent claim 15 recites a computer readable medium comprising, in pertinent part, “a signature representing a data object residing on a second computer readable medium, wherein the **signature is indicative of a state of the data object**”. Applicants respectfully assert that neither Frey, Mukherjee nor Banerjee, taken singly or in combination, teach or suggest such a signature. Claim 15 is therefore also believed to patentably distinguish over the art cited by the Examiner.

Independent claim 21 recites a system comprising, in pertinent part, “**a signature indicative of a state of the one or more data objects, wherein the map is updated when changes are detected and associated with the signature**”. Applicants respectfully assert that neither Frey, Mukherjee, nor Banerjee, taken singly or in combination, teach or suggest a signature indicative of a state of one or more data objects, or updating a map when changes are detected and associated with the signature, as recited in claim 21. Claim 21 is therefore also believed to be in condition for allowance.

Rejections Of Dependent Claims

With respect to claim 4, the Examiner asserts that Frey discloses “wherein during generation one or more **extents** of the data object within the second storage environment are provided”, and cites col. 8, lines 24 – 31 of Frey in support. Applicants respectfully disagree. The cited lines are completely silent with respect to **extents**:

If desired, parity blocks may be computed based on subsets of the file data blocks. It is to be emphasized that the parity block and its generation is optional and is based on a file parameter and is not limited by the position where any particular file data blocks are to be stored. Additional file parameters may include extended attribute file parameters such as, for example, security access levels or encryption information.

In addition, the “generation” mentioned in the cited lines of Frey refers to a generation of “the parity block”, not to “generating a first data structure from the reference representing one or more physical locations of the data object within the second storage environment” as recited in the parent claim 1 of claim 4. Thus, the rejection of claim 4 appears to be improper.

With respect to claim 5, the Examiner asserts that Mukherjee discloses “wherein the generation further includes detecting a mirroring of the data object on at least two storage devices within the second storage environment”, and cites col. 9, lines 19 – 24 of Mukherjee in support. Once again, Applicants respectfully disagree. The cited lines of Mukherjee mention mirrors, but are silent with respect to “**detecting** a mirroring”:

To provide for recovery from the failure of a server or client, mirrors of the managers associated with each of the configurations are maintained on other network nodes. In the preferred embodiment of the invention, mirrors for the managers are maintained on network nodes upon which other managers do not reside. However, it is within the scope of the invention to include mirrors on network nodes upon which other managers do reside.

In addition, the cited lines of Mukherjee do not teach or suggest “detecting a mirroring” as being included within a “generation of a first data structure from the reference representing one or more physical locations of the data object within the second storage environment, wherein one or more extents of the data object within the second storage environment are provided during the generation”, as recited in the parent claims of claim 5. The rejection of claim 5 thus also appears to be improper.

With regard to claims 6 and 17, the Examiner asserts that Mukherjee discloses “wherein during generation metadata associated with the second storage environment and

the data object are provided”, and cites col. 5, lines 35 – 41 and col. 7, lines 6 – 7 in support. Applicants respectfully disagree with this assertion as well. Col. 5, lines 35 – 41 of Mukerjee (quoted above in the discussion of claim 1) do not teach or suggest providing metadata “**during generation** of a first data structure from the reference representing one or more physical locations of the data object within the second storage environment”, as recited in claim 6. Col. 7, lines 6 – 7 merely state that “a system data disk 85 provides system metadata such as file name to disk address mapping” within a “passive disk serverless file system 80”, and also do not teach or suggest providing metadata **during generation** of a data structure from the reference representing one or more physical locations of the data object within the second storage environment. The rejection of claim 6 also appears to be improper.

Claim 17 (in combination with its parent claim 15) recites a map comprising, in pertinent part, “**a first node** representing the data object, **a file system node** representing a file system on a second computer readable medium, **a volume node** representing a volume manager associated with the file system, and **one or more partition nodes** managed by the volume manager, wherein **each node includes metadata**”. Applicants can find no teaching or suggestion of such a map, where each node includes metadata, anywhere in Mukherjee, Frey or Banerjee. Claim 17 is therefore also believed to patentably distinguish over the art cited by the Examiner.

With respect to claim 14, the Examiner asserts that Frey discloses “wherein the method is used to create an image or copy of the first storage environment in the second storage environment”, and refers to “Figure 3B, Element No. 22, i.e., objects {A, B and E} in server 36 and the copy or image of the same in server 38” in support of this assertion. Applicants respectfully disagree. Figure 3B does not show a “copy or image” of objects A, B or E. Rather, Figure 3B shows “files A, B, C, D and E **striped across** two server nodes, a first server node 36 and a second server node 38” (col. 4, lines 39 – 41 of Frey). The letters A, B, E, etc. at the different server nodes 36 and 38 refer to different blocks of the files, not to copies or images of the files: see, e.g., col. 4, lines 24 – 26: “Each data storage system 22 (here, a disk) is shown divided into **stored file blocks**

labeled according to the file A, B, C, D or E from which the blocks originated”.

Furthermore, there is no teaching or suggestion in Frey, Mukherjee or Banerjee of **using the method** recited in claims 9 and 13 (from which claim 14 depends) to create an image or copy of the first storage environment in the second storage environment. Claim 14 is therefore also believed to patentably distinguish over the art cited by the Examiner.

Claim 25 recites a map that is used to **“replicate the second file system within the first file system in a first file system format”**. In rejecting claim 25, the Examiner asserts that Mukherjee “discloses different data or file formats” and cites column 1, lines 27 – 29 and column 7, lines 63 – 67 of Mukherjee in support. Applicants respectfully disagree. The cited lines of Mukherjee are:

(Column 1, lines 27 – 29): Increased constraints are placed on the storage and retrieval of multimedia data over traditional textual and numeric data due to inherent differences in the characteristics of the data types.

(Column 7, lines 63 – 67): At step 90 an initial quantity of bandwidth is allocated to each manager. The initial bandwidth allocations are based on criteria such as prior experience, the expected workload, and the type of data the manager controls.

Applicants can find no teaching or suggestion, in these lines or anywhere else in Mukherjee, Frey or Banerjee, of **“using a map to replicate a second file system within a first file system in a first file system format”**, as recited in claim 25. Accordingly, claim 25 is also believed to patentably distinguish over the art cited by the Examiner.

With respect to claim 26, the Examiner asserts that “Banerjee discloses XML data structure and distributing the data structure through the Internet” and refers to “col. 23, lines 1 – 31, i.e., the components defined in the XML associated with the template are added to the customer site file”. (Applicants assume the Examiner meant to cite column 22, not column 23, which does not contain the text specifically cited by the Examiner.) Banerjee teaches a wizard used to build web sites using stored web site components: “The web site building wizard appliance stores a large number of such components so that a novice user does not have to reinvent them. The components can be represented in

any manner known in the art. In one embodiment, each component is described by an extensible markup language (XML) document.” (Column 21, lines 29 – 35). The “components” taught by Banerjee “handle specific functional needs of an enterprise operating a web site on the Internet.” (Column 20, lines 65 – 66). Examples of the components include “a site logo, a site name, a legal notice, terms of use, and a privacy statement” and “a product or service description, a product/service price, a list of products/services, a component for searching for a product/service among the list of products, a hierarchical list of products/services within categories and subcategories, a component for searching products/services falling within a category or subcategory, support contact information, personnel lists, an item to search a personnel list, a map of the web site, links to related web sites, a calendar of appointments/events, a banner advertisement and a shopping cart.” (Column 21, lines 3 – 20).

In rejecting claim 26, the Examiner specifically asserts that Banerjee’s teaching that the “template are added to the customer site XML file” is a disclosure of “distributing the data structure through the Internet”. The Examiner is incorrect in this assertion. Banerjee does not teach or suggest distributing anything through the Internet in adding to the customer site XML file: see, e.g., column 22, lines 22 – 32: “According to one embodiment, the wizard represents the customer's web site using an XML file (the “customer site XML file”). When the customer initially selects a template, the components defined in the XML associated with the template are added to the customer site XML file. As the user goes from screen to screen in the wizard, the user specifies changes, deletions or additions to the components in the site. In response to the user input entered through these screens, the wizard changes, deletes or adds XML content in the customer site XML file.”

Further, the Examiner asserts that “it would have been obvious to modify both Frey and Mukherjee in view of Banerjee **due to the wide use of the XML language** especially when the Internet is being used as the protocol for the transfer; and also to **increase system performance** by using one very popular language that would minimize the formatting and re-formatting of data to only one common format”. Applicants

respectfully disagree. An alleged “wide use of the XML language” does not make using XML to generate a portable representation of a data structure **representing one or more physical locations of a data object within a second storage environment**, and **distributing the portable representation to a third storage environment**, as recited in claim 26, obvious. Neither Banerjee, Mukherjee nor Frey, taken singly or in combination, teach or suggest creating or distributing XML representations of such a data structure. Furthermore, there is no teaching or suggestion of the performance impact of formatting or re-formatting a representation of such a data structure anywhere in Banerjee, Mukherjee or Frey. Accordingly, claim 26 is also believed to patentably distinguish over the art cited by the Examiner.

The Examiner is no doubt aware that the showing of a **suggestion, teaching, or motivation to combine prior teachings “must be clear and particular Broad conclusory statements regarding the teaching of multiple references, standing alone, are not ‘evidence’.”** *In re Dembiczak*, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999). The art must fairly teach or suggest to one to make the specific combination as claimed. That one achieves an improved result by making such a combination is no more than hindsight without an initial suggestion to make the combination.

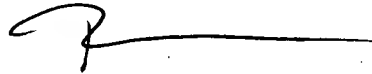
Applicants also respectfully submit that numerous ones of the remaining dependent claims recite further distinctions over the cited art. However, since the independent claims have been shown to be patentably distinct, a further discussion of the remaining dependent claims is not necessary at this time.

CONCLUSION

Applicant submits the application is in condition for allowance, and an early notice to that effect is requested.

If any fees are due, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert, & Goetzel, P.C. Deposit Account No. 501505/5760-16700/BNK.

Respectfully submitted,



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